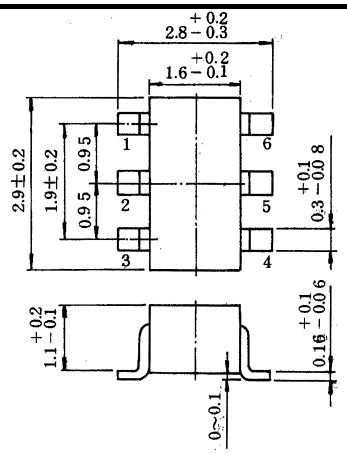
TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT Process)

# HN1A07F

Audio Frequency Small Power Amplifier Applications
Driver Stage Amplifier Applications
Switching applications

- Excellent Currrent gain($h_{FE}$ )linearity
  : $h_{FE(2)}$ =25 (min) at $V_{CE}$ = –6V, $I_C$ = –400mA

Unit: mm




| | |
|---|---|
| JEDEC | — |
| JEITA | — |
| TOSHIBA | 2-3N1A |

Weight: 0.015mg (typ.)

## Absolute Maximum Ratings (Ta = 25°C) (Q1, Q2 Common)

| Characteristic | Symbol | Rating | Unit |
|---|---|---|---|
| Collector-base voltage | $V_{CBO}$ | –50 | V |
| Collector-emitter voltage | $V_{CEO}$ | –50 | V |
| Emitter-base voltage | $V_{EBO}$ | –5 | V |
| Collector current | $I_C$ | –500 | mA |
| Base current | $I_B$ | –100 | mA |
| Collector power dissipation | $P_C$* | 300 | mW |
| Junction temperature | $T_j$ | 150 | °C |
| Storage temperature range | $T_{stg}$ | –55 to 150 | °C |

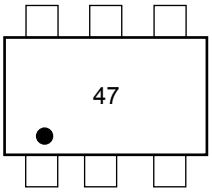
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook (“Handling Precautions”/“Derating Concept and Methods”) and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

*Total rating. Power dissipation per element should not exceed 200mW.

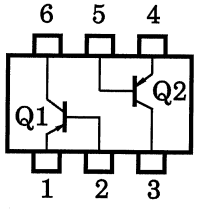
## Electrical Characteristics (Ta = 25°C) (Q1,Q2 Common)

| Characteristic | Symbol | Test Condition | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|
| Collector cut-off current | $I_{CBO}$ | $V_{CB}$ = –50V, $I_E$ = 0 | — | — | –100 | nA |
| Emitter cut-off current | $I_{EBO}$ | $V_{EB}$ = –5V, $I_C$ = 0 | — | — | –100 | nA |
| DC current gain | $h_{FE(1)}$ | $V_{CE}$ = –1V, $I_C$ = –100mA | 70 | — | 240 | |
| | $h_{FE(2)}$ | $V_{CE}$ = –1V, $I_C$ = –400mA | 25 | — | — | |
| Collector-emitter saturation voltage | $V_{CE\ (sat)}$ | $I_C$ = –100mA, $I_B$ = –10mA | — | –0.1 | –0.25 | V |
| Base-Emitter voltage | $V_{BE}$ | $V_{CE}$ = –1V, $I_C$ = –100mA | — | –0.8 | –1.0 | V |
| Transition frequency | $f_T$ | $V_{CE}$ = –6V, $I_C$ = –20mA | — | 200 | — | MHz |
| Collector output capacitance | $C_{ob}$ | $V_{CB}$ = –6V, $I_E$ = 0, f = 1MHz | — | 13 | — | pF |

## Marking



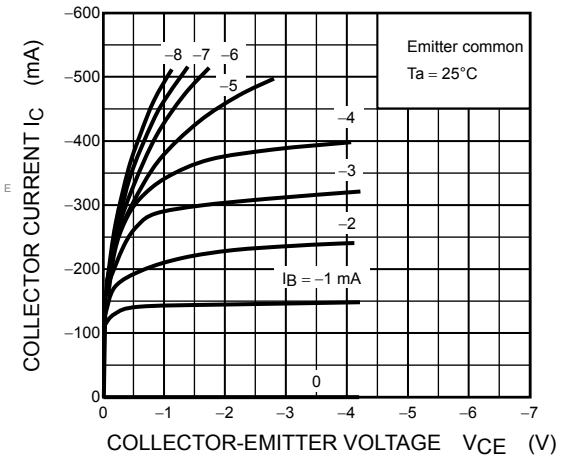

## Equivalent Circuit (Top View)



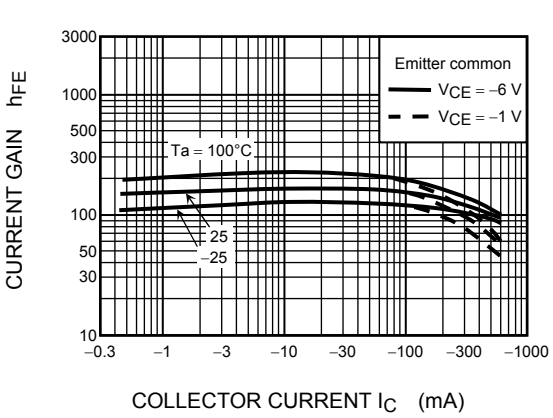

Start of commercial production
2002-04

**(Q1,Q2 Common)**

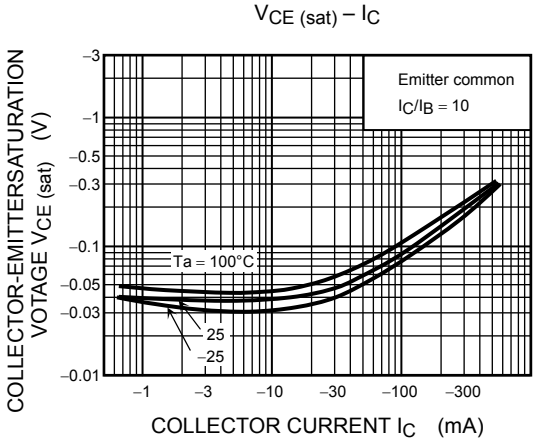
$I_C - V_{CE}$



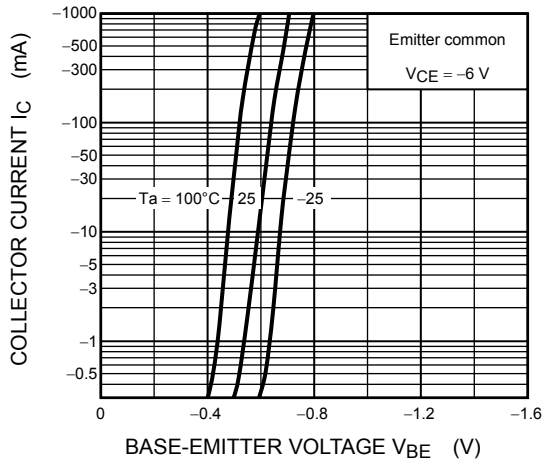

$h_{FE} - I_C$



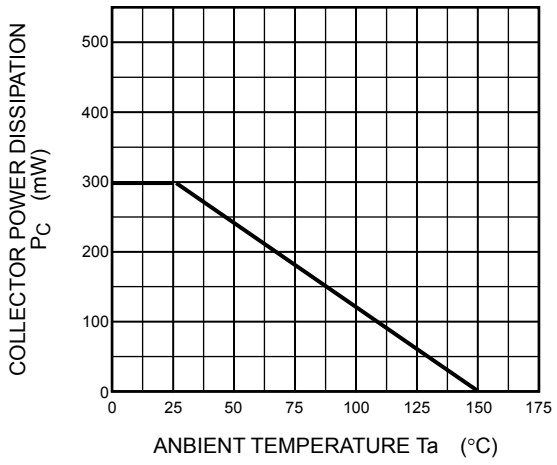

$V_{CE\ (sat)} - I_C$




$I_C - V_{BE}$




$P_{C^*} - Ta$




*Total Rating.

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